

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

- 1 (currently amended): A method for symbol timing synchronization in an orthogonal
5 frequency division multiplexing (OFDM) communication system, the method
comprising:
- (a) converting a time domain digital signal to a corresponding frequency domain
digital signal;
 - (b) calculating phase angles of tones of at least one symbol of the frequency
10 domain digital signal when a symbol timing offset exists;
 - (c) calculating at least one differential phase offset (DPO), which is the difference
between two consecutive gaps, wherein a gap is the difference between the
phase angle of a tone of the symbol of the frequency domain digital signal
when the timing offset of the symbol exists and a correct phase angle of the
15 tone of the symbol of the frequency domain digital signal; and
 - (d) estimating the symbol timing offset ~~with at least one DPO~~ utilizing a
histogram of a group of DPOs, wherein the histogram is obtained by
dividing the interval 0 to 2π into a plurality of sub intervals, and counting
the number of DPOs that fall into each sub interval.
- 20
- 2 (original): The method of claim 1 further comprising removing a cyclic prefix and/or
suffix from between contiguous symbols before converting the time domain digital
signal to the corresponding frequency domain digital signal.
- 25 3 (original): The method of claim 1 wherein the calculations of the gaps and the DPOs are
performed with mod 2π arithmetic, the values of the gaps and the DPOs being within
the range of 0 to 2π .

4 (currently amended): The method of claim 1 wherein estimating the symbol timing offset comprises utilizing ~~a mean~~ a mean of a group of DPOs.

5 5 (currently amended): The method of claim 1 wherein estimating the symbol timing offset comprises utilizing a ~~median of~~ median of a group of DPOs.

6-7 (cancelled).

10 ~~8~~ ⁶ (currently amended): The method of ~~claim 7~~ claim 1 wherein utilizing the histogram to estimate the symbol timing offset further comprises selecting a median of the range represented by the sub interval that the most DPOs fall into as the symbol timing offset.

15 ~~9~~ ⁷ (currently amended): The method of ~~claim 7~~ claim 1 wherein the sizes of each sub interval are equal.

~~10~~ ⁸ (currently amended): A symbol timing synchronization system for an orthogonal frequency division multiplexing (OFDM) communication system, the symbol timing synchronization system comprising:

20 a serial-to-parallel converter ~~capable of~~ for performing serial-to-parallel conversion on an input time domain digital signal;

a fast Fourier transform (FFT) module electrically connected to the serial-to-parallel converter for transforming the time domain digital signal into a frequency domain digital signal; and

25 a demodulator electrically connected to the FFT module comprising:

a symbol timing offset estimator comprising:

a phase calculator electrically connected to the FFT module for calculating phase angles of tones of at least one symbol of the

frequency domain digital signal output from the FFT module
when a symbol timing offset exists;
a phase offset calculator electrically connected to the phase calculator
for calculating at least one differential phase offset (DPO), which
is the difference between two consecutive gaps, wherein a gap is
the difference between the phase angle of a tone of the symbol of
the frequency domain digital signal when the timing offset of the
symbol exists and a correct phase angle of the tone of the symbol
of the frequency domain digital signal; and
an estimating module electrically connected to the phase offset
calculator ~~capable of for~~ utilizing ~~the at least one DPO to~~
~~estimate the symbol timing offset~~ a histogram of a group of
DPOs, wherein the histogram is obtained by dividing the interval
0 to 2π into a plurality of sub intervals, and counting the
number of DPOs that fall into each sub interval; and
a demodulation module for demodulating the frequency domain digital
signal.

11 (currently amended): The symbol timing synchronization system in claim 10 wherein
the estimating module is ~~capable of calculating~~ calculates a mean of a group of DPOs
and ~~utilizing~~ utilizes the mean to estimate the symbol timing offset.

12 (currently amended): The symbol timing synchronization system in claim 10 wherein
the estimating module is ~~capable of calculating~~ calculates a median of a group of
DPOs and ~~utilizing~~ utilizes the median to estimate the symbol timing offset.

13 (cancelled).

11
14 (currently amended): The symbol timing synchronization system in claim 10 wherein
the serial-to-parallel converter ~~is capable of removing~~ removes a prefix and/or suffix
from between symbols.

12
5 15 (new): The symbol timing synchronization system in claim 10 wherein the estimating
module utilizes the histogram to estimate the symbol timing offset by selecting a
median of the range represented by the sub interval that the most DPOs fall into as the
symbol timing offset.

13
10 16 (new): The symbol timing synchronization system in claim 10 wherein the sizes of
each sub interval are equal.